

REMARKS

Applicant hereby respectfully submits the above amendment. The amendment to claims 6-10, 18, 25 and 32 is to correct certain informalities. New claims 33 and 34 were added. Support for the new claims 33 and 34 can be found, *inter alia*, p. 15, lns. 1-17 and p. 3, lns. 14-17. Thus, no new matter has been added by this amendment. After amendment, claims 1-34 are pending. For two newly added independent claims, a fee of \$86 is due (small entity). A credit card payment form (signed) is hereby enclosed.

The Office Action mailed August 27, 2003 (hereinafter the "8/27/03 OA") has examined originally filed claims 1-32. According to the 8/27/03 OA, claims 19-24 and 26-31, as originally filed, are allowed, claims 6-10, 25 and 32 are objected for informalities, and claims 1-5 and 11-18 are rejected.

Claim Objections

The Examiner objected to claims 6-10, 18, 25 and 32, as originally filed, because of informalities. By this amendment, all the informalities of claims 7-10, 18, 25 and 32 are amended. Thus, claims 7-10, 25 and 32 are allowable.

The Examiner made two objections to claim 6. The first objection relates to additional space between "provide" and "at least". By this amendment, this informality is corrected.

The Examiner further suggested amending the phrase "the RF signal's reference signal" in claim 6 to "an RF signal's reference signal." The term "RF signal's reference signal" refers to the reference signal of the particular "radio frequency (RF) signal" specified in the preamble of claim 6, and it does not refer to a reference signal of a random RF signal. Thus, applicant respectfully traverses the second objection for claim 6.

Claim Rejections

The Examiner rejected claim 1 under 35 U.S.C., first paragraph as being a signal means claim with under breadth. The Examiner stated that “the claim covers every conceivable structure for achieving the stated property while the specification discloses at most only those known to the inventor.”

The Examiner also rejected claims 1-5 as being unpatentable over Currie et al. (U.S. Patent No. 5,230,097) under 35 U.S.C. 103(a). The Examiner stated that Currie et al. describes a method using an electronic circuit to combine a radio frequency signal, its reference signal and a third signal having a predetermined frequency to provide a new signal whose frequency is solely responsive to the predetermined frequency. The Examiner further stated that Currie et al. describes how to process phase and amplitude information. The Examiner, thus, stated that it would have been obvious to one of ordinary skill in the art to practice the claimed invention following the teaching of Currie et al. The Examiner also stated that Currie et al. describes other steps required in the dependent claims of claim 1 and thus other claims dependent on claim 1 are not patentable.

The Examiner further rejected claims 11-18 as unpatentable over Currie et al. in view of Atherley et al. (U.S. Patent No. 5,140,198) under 35 U.S.C. 103(a). The Examiner stated that Currie et al. discloses all the limitations of claim 11 without disclosing two phase shifters. However, the Examiner stated that Atherley et al. discloses two 90 degree phase shifters. Thus, claim 11 would have been obvious in light of Currie et al. and Atherley et al. Furthermore, the Examiner stated that all the limitations required in the dependent claims of claim 11 are

described in Currie et al. or Atherley et al. Thus, claims 11-18 are unpatentable under 35 U.S.C. 103(a).

Applicant respectfully traverses the rejections for reasons, as follow:

Rejection – 35 U.S.C. 112

The present invention describes a unique method in solving the problem of down-converting a radio frequency (RF) signal's frequency without compromising the signal's phase and amplitude measurement. By combining different signals, the prevent invention describes a method of down-converting a RF signal to a precise, predetermined frequency. Meanwhile, after such down-conversion, the phase and amplitude information of the RF signal is not affected. There are many applications for the method described in the present invention, e.g. various radio frequency receivers.

The method of the present invention is different from traditional approaches, which generally involve the use of phase locked loop. Using a phase locked loop, the output signal after down-conversation is not a single signal having a predetermined frequency. Rather, the output signal often consists a group of signals having a main peak with a predetermined frequency and many “noise” signals having frequencies in the surrounding area. These noise signals often interfere with the measurement of phase and amplitude of the main signal. Because of these, the measurement of phase and amplitude is often affected. Thus, the method described in the present invention provides significant advantage over the approaches described previously.

With respect to 35 U.S.C. 112 (first paragraph), the “focus of the examination inquiry is whether everything within the scope of the claim is enabled.” See M.P.E.P. 2164.08. Accordingly, the key factor is whether a claim as a whole is enabled. In the present application, claim 1 describes a method of using an electronic circuit to combine three radio frequency

signals to obtain a signal have certain unique properties. The specification describes specific examples of how to combine a radio frequency signal and its reference signal, how to combine the output signal with a new signal to obtain a new signal having specific properties. Thus, claim 1 as a whole is fully enabled.

According to M.P.E.P. 2164.08,

To provide effective incentives, claims must adequately protect inventors. To demand that the first to disclose must limit his claims to what he has found will work or to materials which meet the guidelines specified for 'preferred' material in a process such as the one herein involved would not serve the constitutional purpose of promoting progress in the useful arts.

See M.P.E.P. 2164.08. Thus, the applicant is entitled to a fully enabled claim and should not be required to limited the claimed invention to one or several specific examples included in the specification. Thus, the applicant respectfully traverses the rejection under 35 U.S.C. 112.

Rejection – 35 U.S.C. 103(a)

The rejection of claims 1-5 and 11-18 are mainly in view of Currie et al. Compared to the present invention, Currie et al. describes a completely different approach in down-converting a radio frequency signal. In accordance with the teachings of Currie et al., the output signal is not a signal "solely responsive to the predetermined frequency of the third signal", as claimed in the present invention. Rather, the output signal after down-conversion consists of a group of signals have different frequencies. As stated in Currie et al.

It will be further understood that the present invention provide means for conversion from a first intermediate frequency to a second lower intermediate frequency in RF circuit application without requiring a phase locked loop between the receiver and the transmitter. This is effected by providing double conversion instead of a slower-reacting RF phase locked loop, and only utilizing a phase locked loop in the IF stages to maintain a 100kHz difference between signals provided from the 120.0/120.1 oscillator.

Currie et al. Col. 12, lns 42-51 (underlined added); *see also* Figure 1, block 10. Accordingly, the method in Currie et al. describes the use of a phase locked loop. The mechanism of phase locked loop is to enable an output signal to maintain a constant phase angle relative to a reference signal. To do this, a phase locked loop constantly fine tune the output signal's frequency so that it falls within a certain range. The drawback for using a phase locked loop is that the output signal is not a signal having a frequency solely responsible for a predetermined frequency, rather the output signal consists of a group of signals having a main peak at the predetermined frequency and numerous other signals with frequencies surrounding the main peak. This not only affects sensitivity, range or frequency agility, but also significantly affects accuracy of phase and amplitude measurement. This is not what is described and claimed in the pending claims 1-5 and 11-18 of the present invention. The newly added claims 33-34 explicitly point out that certain properties of the present invention, and emphasize that the present invention does not require the use of a phase locked loop or a device having similar properties for down-converting a radio frequency signal while preserving its phase and amplitude information. Thus, it would not have been obvious for a person skilled in the art to know the claimed invention in view of Currie et al.

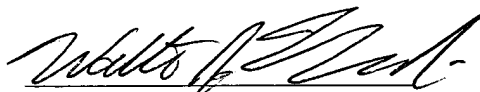
Atherly et al. (U.S. Patent No. 5,140,198) discloses the use of two 90 degree phase shifters in converting an RF signal to a new signal. However, Atherly et al. does not describe how to combine a radio frequency (RF) signal, its reference signal, and a third signal having a predetermined frequency to obtain a new signal having a frequency that is solely responsive to the predetermined frequency and having a phase responsive to that of the RF signal. As described above, Currie et al. does not describe the claimed invention. Thus, it would not be obvious to combine Currie and Atherly to practice the invention described in the present application.

Accordingly, the applicant respectfully traverses the rejections.

Enclosed please find a credit card payment for a total fee of \$741. In the event that the Examiner has any further concerns, applicant requests a call to be made to applicant's attorney at the number listed below.

Respectfully submitted,

Dated: 2/26/04



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